

fixed and useful form. Furthermore, it was discovered that soil inoculated with such microbes would grow these plants even when innocent of any trace of manurial nitrogen. The deduction is obvious. Why should we not blossom the desert with clover or peas, and thereafter plough the plants into the ground to afford manure for a succeeding crop of wheat.

In 1896 Nobbe and Hiltner produced this microbe in a commercial portable form under the name of "Nitragin." The experiment failed, as nearly all first experiments fail. The bacteria died, and, as it subsequently appeared, probably for want of suitable food, and possibly, too, from injuries suffered by secretions from the seed itself in the early stages of germination.

But to know the cause of failure was to succeed. They now supply this necessary nourishment in the form of grape sugar and peptones added to the water in which they are distributed for spreading upon the soil. Their measure of success has been so great that we find to-day several manufacturers perfecting the method

and establishing their processes for the wholesale production of nitrifying microbes. Another method has been ascribed to Professor G. Moore, of the United States Department of Agriculture. He has sent out to the farmers of the country the dried germs packed in cotton. With them go two packages containing the food upon which they are to multiply when placed in water—one containing granulated sugar, potassium phosphate, and magnesium sulphate, and the other ammonium phosphate.

The microbes when placed in the solution of these substances multiply with prodigious rapidity and serve to inoculate either the seed or the soil.

But there are many other nitrifying microbes besides those concerned with leguminous plants—dozens of tribes and hundreds of species, and investigation is to-day feverishly busy with them. We have every reason to believe that by multiplying nitrifying organisms alone, we should be able, in some measure at least, to restore to the soil the fertilising nitrogen which in the past we have wilfully and extravagantly wasted.

We have said that the lightning bolt burns the air in its path into oxides of nitrogen which, when washed by the rain into the soil, quickly become fixed into nitrates. We have learned to harness the lightning and why should we not, therefore, imitate nature in this respect as well, and utilise the combining efficiency of the electric spark, and burn the air to make our daily bread?

Over a hundred years ago the masterly Cavendish showed that with the tiny electric sparks at his command this could actually be accomplished, and afterwards, by this very method, Lord Rayleigh burned the air to obtain the interesting argon hidden within it. In the powerful heat of the electric arc there is a combustible gas, and the only reason that this gas, when once ignited, has not spread through the surrounding atmosphere and deluged the world in a sea of nitric acid is the peculiar fact that its ignition point is above the temperature of its flame. It is not hot enough to set fire to the adjacent mixture.

(To be continued.)

Architecture and Building.

The Architectural Editor will be glad to receive suggestions or matter from those interested in this section.
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PROVINCIAL NOTES.

A substantial Nurse's Home has just been completed in Gisborne. Architect, A. Natusch.

A residence has been erected in Feilding for Mr. Norman Gorton. Architect, C. Tilleard Natusch.

A large building is being erected as soapworks, at Belfast, for Mr. Walcott Wood. Architect, F. J. Barlow; contractors, Soanes Bros.

A residence in Hanson street, Wellington, for Mr. P. Wills, is in course of completion. Architect, J. Charlesworth; contractor, Richard White, Petone.

The contract price for the erection of additions to "Rototawai," Featherston, is about £2,000. Architect, John S. Swan; contractor, W. Benton, Featherston.

A four-storied brick and cement warehouse has just been erected in Lichfield street, Christchurch, for Messrs. Reynolds & Kinvig. Architect, F. J. Barlow; contractor, H. J. Otley.

The Education Board, Wellington, have let a contract to Humphries Bros. for an Industrial School at Levin. The contract price of this building is £827. Architects, T. Turnbull & Son.

A residence at the corner of Hill street and Golder's Hill is in course of erection for Mrs. F. Riddiford. The contract price of this building is £2,300. Architect, J. Charlesworth; contractor, A. J. Rand.

A two-storied brick and cement shop is being erected in Colombo street, Sydenham, for Mr. W. Claxton. Architect, G. Gregory; contractors, Inglis & McLeod.

Extensive additions and alterations are being carried out at the Poverty Bay Turf Club's course at a cost of £3,000. Architect, A. Natusch; contractors, Mackrell & Colley.

A one-storied building, intended for two shops and to be known as Hulston's Buildings, is in course of erection in Madras street, Christchurch. Architect, G. Gregory; contractor, Jas. Greig.

A picturesque residence of 14 rooms with a full complement of all up-to-date conveniences is being erected in Fitzherbert street, Palmerston North, for Mr. W. Hankins. Architect, C. Tilleard Natusch.

Three workers' cottages are in course of erection for the New Zealand Government at Petone. The contract price for each of these cottages is £364 6s. 8d. Architect, J. Charlesworth; contractor, W. J. Barrie.

A very up-to-date residence is in course of completion for Captain Grey at Kelburne. The contract price of this building is about £1,300. Architect, James Bennie; contractors, Heaton & Jones.

A two-storied brick shop and showrooms, with reinforced concrete foundations and concrete bands, is being erected next to the Masonic hotel, Gisborne. Architect, A. Natusch; contractors, Mackrell & Colley.

The old White Swan hotel, in Tuam street, Christchurch, is being replaced by a modern two-storied building of brick with cement front. The contract price of this building is about £3,500. Architects, S. & A. Luttrell; contractor, C. H. Cox.

The Waverley private hotel in Marion street, Wellington, has just been completed to the order of Messrs. Broadbent & Haworth, at a cost of about £2,000. The building has two floors and is built of brick and stucco. Architect, James Bennie; contractor, W. G. Rowntree.

A two-storied brick and stone building, with an elaborately designed front, is being erected in Worcester street, Christchurch, for the Dunlop Tyre Co. It is understood that the front will be carved by H. Wilson, stone and wood carver, Christchurch. Architect, F. J. Barlow; contractors, Moore Bros.

A contract has been signed for the erection of a four-floor brick and concrete warehouse in Victoria street, Wellington, for Messrs. Sargood, Son & Ewen. The architects estimate of £3,000 was the contract sum, and the building is expected to be completed about Christmas time. Architect, John S. Swan; contractor, John Wood.

The new brick Sunday school designed by Mr. Clere and erected by Mr. George Garner for St. Thomas's parish, Wellington South, was formally dedicated recently by the Bishop of Wellington in the presence of a large congregation. The building has been designed to meet the double purpose of a Sunday school and parish hall. There are several class rooms and library, with a kitchen and other conveniences. The hall and gallery are capable of seating between five hundred and six hundred people.

A two-storied building in brick and stucco is being erected in Queen street, Masterton, for J. L. Murray Esq. This is to be called the "Exchange Buildings," and the ground floor consists of three large shops with ante-shops, 9 ft. main entrance corridor, tea room of up-to-date dimensions, and three very large sample rooms. The first floor has a series of offices, strong-rooms, photo studio, and a very large meeting-room, etc., etc. The contract price for this building is about £8,000. Architect, James Bennie; contractor, John Hunter.

A substantial up-to-date brick building called the Denbigh hotel, of over 70 rooms, is being erected in Feilding. Architect, C. Tilleard Natusch; contractor, W. Wilkinson.

A new residence for Mr. Frank Moores, near Kai Iwi, Wanganui, is drawing rapidly towards completion. This residence has a frontage of 156 ft. with a fine 90 ft. colonnade of Ionic columns and entablature. It is built on the crest of a hill upon very solid concrete foundations, and contains a spacious and well-lighted billiard room. Architect, C. Tilleard Natusch.

Good progress is being made with the Police Station additions in Hereford street, Christchurch. These consist of a substantial brick and stone building, to replace the old rooms erected in the early provincial days and which are now in a dilapidated and damaged condition. In the new building the ground floor will be occupied as offices, mess room, recreation room, etc., while the upstairs portion will form the single constables' quarters, and provide bed accommodation for thirty-six men. This, our correspondent states, will meet all emergencies and prove a great saving to the Department. Contractors, Hansford & Hughes.

Messrs. Sanders Bros. have just completed the purchase, at £3,550, of one of the few remaining large blocks of vacant land in the centre of Wellington city. The land in question is in Ingestre street, and contains half an acre of level ground, being 132 ft. by 165 ft. It is the intention of the firm to erect thereon an up-to-date building-construction plant and joinery factory, the firm's present premises in Little Taranaki street having proved to be totally inadequate. The firm also recognises the importance of preparing for the advent of steel buildings, which mode of erection must be adopted if high buildings are required.

Sourensen, the Danish builder of windmills, recently discovered, through accident, a form of windmill which tests show to develop more power than any other form heretofore tested. He had been running an old mill bearing ten wooden vanes. In a storm, four of these vanes were carried away, when, to the wonder of its proprietor, the old mill worked better than before. Inspired by this demonstration, he made some further experiments, and perfected a wind motor of conical form, having six vanes, the ends of which curved toward the summit of the cone. Prof. P. LaCour, who has established, by authority of the Danish Government, an observatory for the study of wind power, showed that the new conical aeromotor developed more power by nearly five per cent. than that of the "Ventocrat" type, whose surface is seven times as great; and thirty-one per cent. more than the "Rose of the Winds" type, with a surface three times as great; and twenty-nine per cent. more than that of the old Sourensen type. It is predicted that the discovery of this new form of wind engine will go far towards making wind power, which is now largely lost, available for general use.]